

URBAN/MUNICIPAL
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91153

Integrated Information Systems
(IIS)

Strategic Plan 1992-1996

Prepared by the IIS Steering Committee



CA40N HBLW26

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December 4, 1991

URBAN MUNICIPAL

DEC 6 1991

GOVERNMENT DOCUMENTS

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IIS Steering Committee

The members of the IIS Steering Committee are as follows:

Margaret Cunningham, Trustee
Heather Darby, Secretary, Information Management Services
Len Dixon, Manager, Computer Services
Pat Gillie, Superintendent of Schools
Paul Gordon, Vice Principal, Secondary School
Sandy Hill, Trustee
Rick Kawai, Superintendent, Information Management Services
Paul McWhinnie, Trustee
Keith Rielly, Director of Education & Secretary of the Board
Daryl Sage, Manager, Special Projects Audit, Assessment
Paul Shewfelt, Superintendent of Finance and Treasurer
Bruce Sinclair, Superintendent, Human Resources
Darrel Skidmore, Superintendent, Program
Linda Slade, Senior Employment Officer, Human Resources
Al Stockwell, Associate Director
Ron Watson, Principal, Elementary School
Dave Woolley, Consultant, Managerial Design Corporation

IIS Strategic Planning Workshop Participants

The Steering Committee greatly appreciated the contributions made by the following people who were involved in the Strategic Planning Workshop:

Wayne Atanas, Teacher, Elementary School
Marie Bountrogianni, Chief Psychologist
Gerry Cooper, Administrative Assistant, Secondary School
Dave Didur, Coordinator, Computers in Education
Sheila George, Secretary, Area Office
Colleen Hycz, Supervisor, Training Support Services
Suzanne Nolan, Vice Principal, Elementary School
Duane O'Connor, Design Engineer, Plant Department
Gord Perrault, Principal, Secondary School
Marie Shwaluk, Secretary, Secondary School
Michael Silbert, Teacher, Secondary School
Joanne Stewart, Secretary, Elementary School

IIS Steering Committee members also participated in the planning workshop.

1 - EVOLUTION OF SYSTEMS

From 1967 when the Board installed its first mainframe computer, there has been continual development of automated systems. Since the mid 1980's, the emphasis has been on developing a network environment that would support the operation of online systems for administrative functions.

In 1987 the Board approved a Computer Services proposal to install a city-wide telecommunications network to service all Board locations. This network would be driven by an upgraded mainframe computer at the Education Centre and microcomputers would be used in the school offices to access the network.

In January 1989 the final school location was incorporated into the network, giving all schools access to the new online Student Information System (SIS). This system was the first interactive online system implemented on the Board's mainframe computer. Initial implementation had begun in September 1985 with 12 secondary schools and 2 pilot elementary schools, each school having one online device. Total online devices in the school offices and area offices now number 345. Online devices in the Education Centre number 145. In May 1991 the installation of an electronic mail system (PROFS) was completed, making it possible for all these online devices to exchange information.

During the past few years, administrative workloads in the Education Centre and school offices have increased dramatically. The use of technology to help reduce the additional workload has not kept pace with the changes that complicate administration. This situation has implications for the evaluation of current systems (see Section 2) and the benefits and savings in the area of improved productivity (see Section 4). Among the significant workload, changes result from:

- Legislation from all levels of Government (e.g., employment equity, freedom of information, workplace safety, separate school funding)
- 11 organized bargaining groups
- Population shifts
- Individualized timetables for secondary students
- Special education tracking and Bill 82
- Tax assessment tracking
- Fringe benefit administration.

With increasing demands for information and administrative efficiency, information systems are frequently the focal point for expected solutions.

Exhibit 1 on page 5, **opposite**, presents more historical detail on the evolution of the Board's systems from 1967 to the present, including the implementation of new applications, systems and technologies. It also clearly reflects the shifting priorities and consequent system development activities during this period:

- during the 1970's, the Board's focus was on financial and employee systems, but little has been done in these systems recently
- in the 1980's the Board's focus shifted to student systems, personal computers, office systems and a board-wide data communications network

SYSTEMS EVOLUTION

1967-1972	1973-1978	1979-1984	1984-1989	1990-1991
Financial Information Systems - Accounts Payable - General Ledger - Standard Supplies Purchasing - Payroll Systems	- Budget System - Upgrade Standard Supplies Purchasing - Payroll Budget	- Energy Recording - Work Orders - Debentures	- Finance system, on-line query into 2 master files - Budget: on-line update - Payroll - tax tables & variables on-line updates	- Finance system daily updating capability - Payroll electronic funds transfer
Employee Information Systems - Grid Analysis		- Expand payroll employee file for employee information	- Employee system upgrade and on-line enquiry	
Student Information Systems - First student system - Film Booking - Library Cataloguing	- Student programming	- Student system upgrading	- Student system on-line All Composite Secondary Elementary Pilot - Special Education information into Student System - Co-op Education Employer Database on-line updating - Media Services on-line Booking System	- Student system on-line All Elementary Schools All Vocational Secondary - Special Education information upgrading - New Secondary Attendance System - Westmount Local Area Network - Microcomputers Information Download from Mainframe
Office Information Systems		- Personal Computers - Three schools pilot on-line basic word processing	- Student System Training - Microsoft WORKS - Word Processing, Graphics - Spreadsheets, Database	- Expansion of Training and Support program - Desktop Publishing - Advanced Word Processor - EXCEL spreadsheet - PROFS electronic mail system
Technology & Computer Services - First Mainframe	- Mainframe Upgrade (1978)		- Training and Support section - Mainframe Upgrade (1988) - Programmer re-training for on-line systems - Personal Computers - City-wide computer network	- Mainframe Upgrade (1991) - Personal Computers

- the Board has continually invested in upgrading its mainframe computer and focussed on client training

The results of this historical investment strategy are shown in the next section 2 - Current Environment.

2 - CURRENT ENVIRONMENT

Section 2 evaluates the current systems on their abilities to meet the clients' current and future needs. It presents:

- a summary evaluation based on nine key areas
- evaluations of the accomplishments and issues to be addressed in each area, along with supporting comments from clients familiar with the Board's systems.

Summary Evaluation

Exhibit 2 (see page 8) illustrates graphically how well the current systems and resources are meeting client needs. Exhibit 3 (see page 9) provides a summary of the specific accomplishments and issues for each of the evaluation areas. These accomplishments and issues form the basis for establishing priorities and areas requiring action in this strategic plan. Exhibits 2 and 3 show that:

1. The investments in the Student Information System (SIS), Office Information Systems (OIS includes IBM's PROFS plus personal computer word processing, spreadsheets, etc.), the Board's mainframe computer, and the city-wide data communications network are effective and these resources are well utilized by clients.
2. Financial Information Systems (FIS) and Employee Information Systems (EIS) are not meeting the needs of clients. Significant investments will be needed to upgrade them.
3. Personal computers (PCs), client skills, and computer-services support will require some enhanced investment, primarily to meet the demand to expand the network to handle more clients, automate manual systems and upgrade existing automated systems.

This plan focuses on what needs to be done to address the unsatisfied needs identified above. More detail follows on the evaluations in each area.

Exhibit 2

Evaluation of Current Systems

Evaluation Criteria	Needs Unsatisfied										Needs Satisfied	
	10%				50%							100%
Financial Information System												
Employee Information System												
Student Information System												
Office Information Systems												
Client Literacy/Independence												
Computer Services Support												
PC Workstations												
Data Communications Network												
Mainframe												

Exhibit 3
Evaluation Areas

Key Area	Accomplishments	Issues to be addressed
Financial Information Systems	+/- Basic financial reports are available, but not timely	- Basic systems exist, but need upgrading - Provide on-line access from schools/centralized data entry - Ongoing enhancements and development/modifications required - Lack of integration between systems - Some key applications to be automated
Employee Information Systems	+/- Basic information exists but not readily available or updated on a timely basis	- Same as above
Student Information Systems	+ Most SIS applications are in place + Client response extremely positive, especially Elementary schools + Media services online film scheduling in place	- Curriculum resources system will have major benefits to classroom - Ongoing enhancements and development/modifications required - Require higher level of management awareness
Office Information Systems	+ All clients trained and high level of satisfaction + All basic office tools implemented	- Ongoing training for new clients and upgrading current clients - Growing demand for advanced tools
Client Literacy/Independence	+ 300+ staff trained in SIS and office systems in schools + 100+ staff trained at Education Centre office systems	- Training required for new applications and upgrading of skills for current clients and introductory training for new clients and casual staff - Time for training in elementary schools
Computer Services Support	+ High quality staff/support	- Understaffed with training backlog
PC Workstations	+ All areas of Board have greater than 50% potential clients automated for a total of 490 work stations + Only supporting two main vendors (IBM and Apple)	- More clients yet to be added in all areas
Data Communications Network	+ Community network to all schools and area offices exists	- Minimal links to external agencies - Client growth may require more lines - Expansion required in Education Centre
Mainframe	+ Excellent response/performance, reliability	- Will require upgrades as more clients added - New software to support unattended operations after hours remote access

Client Feedback

Client feedback shows both frustration and satisfaction. In the case of the Finance and Employee Information systems, frustration appears to result more from not having up-to-date information technology and systems, while being burdened with more and more administrative workload. With the Student and Office systems, frustration seems to emanate more from wanting even more of a good thing.

Satisfaction is also evident. Many positive and encouraging comments have been received with regard to the installation of microcomputers and appropriate software and also the in-house-developed online Student Information System. More recently the PROFS electronic mail system has generated an enormous amount of positive feedback. Computer Services staff responsible for the design, installation, training and support of hardware and software have received many indications of client satisfaction.

The possibilities for continued success in the future with regard to the updating of Financial and Employee Information systems, might be gauged by some of the explicit comments made during a recent survey of our schools with regard to the Student Information System:

"...availability now of current, highly accurate, and timely information with which school personnel can perform their duties."

"...the more that this system has provided, the more that schools have discovered further uses and needs for it."

"...the equipment provided to school offices for the operation of the SIS - PC's and printers - has been usable in other office functions."

"...Curriculum Resources System.....the provision of this system will have the most direct benefit to the teaching/learning processes in our schools, and is worthy of maximum consideration."

"This PROFS is great! I love it! I can communicate with whole groups of people at once, rather than make a series of calls all with the same message. And in the area of time management, PROFS allows me to deal with much of my mail in an efficient manner."

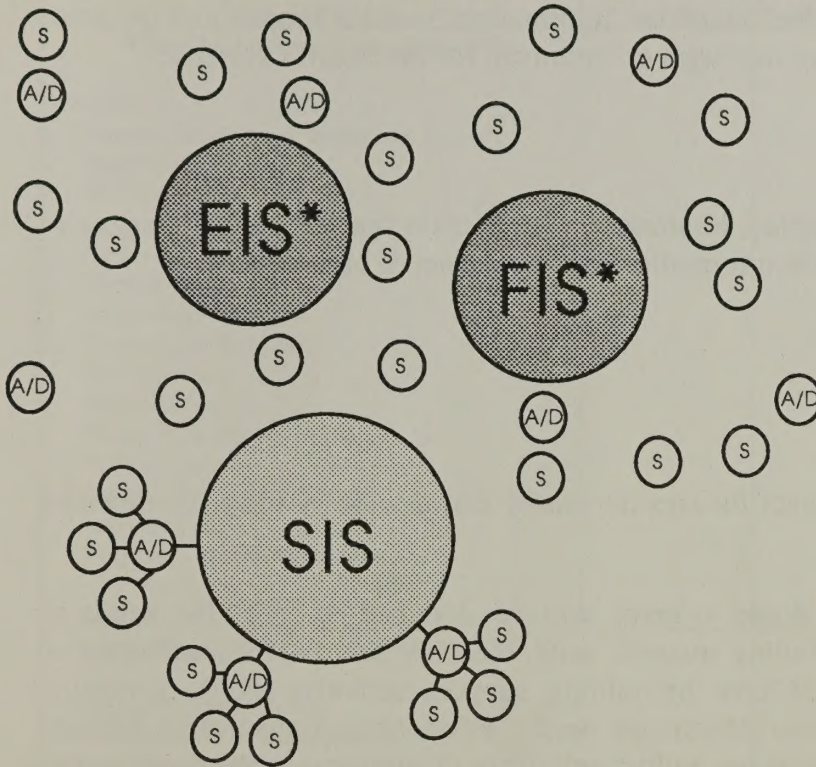
Chris Lebi, Principal, Gordon Price School, H.P.A. President

"The critical decision to close schools due to inclement weather must be carried out efficiently, safely, and without error. Once made, the decision must be transmitted quickly to all schools, but poor communication has often been the weak link in the chain of actions. Traditionally, schools have been phoned, and those at the end of the phone list have sometimes received their authorization to close too late to act upon it properly. Imagine getting the call at 11:55 a.m., when all the pupils were dismissed for lunch at 11:45!"

The electronic messaging system has helped immeasurably. Now, the close message can be sent to all schools simultaneously, in time to institute closure procedures."

IIS Vision

Current Environment



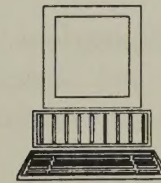
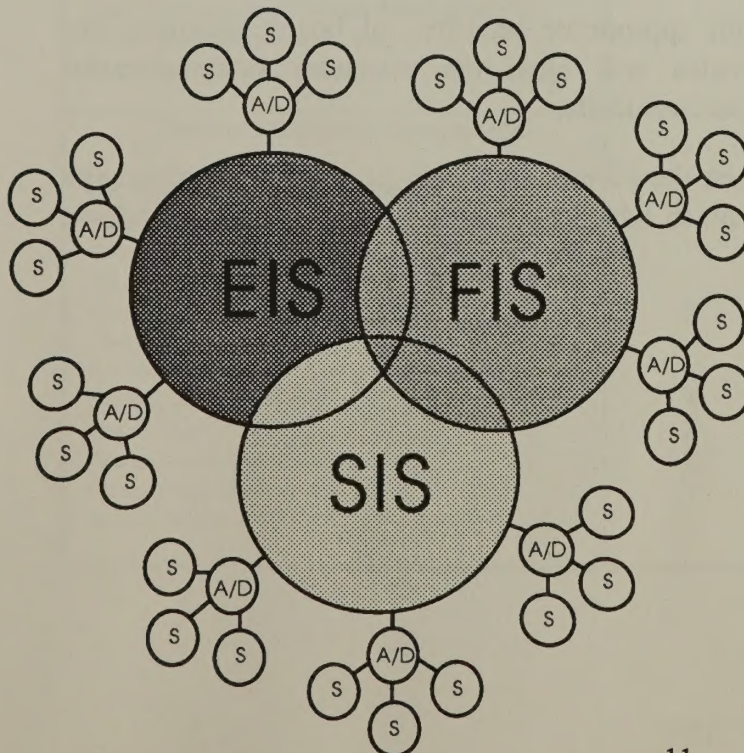
* FIS/EIS Traits

- 1970's vintage
- islands of information
- limited on-line capabilities
- expensive to operate
- no school/area office networks for FIS/EIS
- conflicting data on finances and employees



490
workstations

Target Environment



938
workstations

Future Traits

- linked sites
- integrated systems
- one version of truth on finances, employees and students

Legend

A/D - Area Office/Departments
S - Schools

3 - TARGET ENVIRONMENT

This section describes the mission of the Integrated Information Systems project and the goals and strategic principles that will achieve the target environment for the Board's systems.

IIS Project Mission

The mission of the IIS project is to develop, implement and maintain shared board-wide systems that provide accurate, timely and reliable information to meet the needs of all clients.

IIS Project Goals

The major goals are as follows:

1. **Systems focus** - The IIS project focuses on shared Board-wide systems for finances, employees, and students.
2. **Client focus** - The shared Board systems will be designed to meet the needs of authorized client groups, including trustees, staff, students, and parents, and selected external agencies. Clients will have the training, support, authority and responsibility to identify and address their own information needs. Information Management Services will consult with, advise and support multi-disciplinary client teams in the development and implementation of shared Board systems.
3. **Information quality** - Information will be 100% accurate and updated immediately. Information in the integrated FIS, EIS and SIS will be the basis for all reporting and decision-making at the schools, area offices and Education Centre. There will be only one version of the truth, and no duplicate systems.
4. **Communications technology** - With appropriate security, all board locations, key clients and selected external agencies will have the necessary communication technology to exchange information electronically.

Exhibit 4, on page 11, depicts the change from the current environment -- in which the major systems are separate, to the target environment, in which the major systems are integrated and clients have online access.



Exhibit 5
Application Status

KEY SYSTEMS	Exists - is O.K.	Exists - Needs upgrade	New	Under developmt
Financial Information Systems (FIS)				
<i>Payroll</i>		X		X
<i>Financial Reporting & Budgeting Systems</i>				
Budgeting		X		
Purchasing		X		
Accounting			X	
Grants and Subsidies		X		
General budget		X		
Assessment		X		
Property and Insurance			X	
Transportation			X	
Warehousing			X	
Work Order System		X		
Energy System		X		
<i>Financial Analysis & Control</i>				
Forecasting			X	
Program Costings/Monitoring			X	
Audit			X	
Employee Information Systems (EIS)				
<i>Staffing/Position Control</i>		X		X
<i>Leaves/Absence Management</i>		X		
<i>Time/Attendance Monitoring</i>			X	
<i>Wage and Salary Administration</i>		X		
<i>Benefits Administration</i>		X		
Employment Application Management			X	
Applicant Tracking/Employment Equity			X	
Supply Staff Dispatching			X	
Job Evaluation/Classification		X		
Employee Records		X		
Collective Bargaining/Contract Maintenance		X		
Staff Training/Development Monitoring			X	
Skills/Qualifications Inventory		X		
Performance Management			X	
Student Information Systems (SIS)				
<i>Curriculum Resources Scheduling</i>			X	
<i>Download to Microcomputer</i>		X		X
<i>School Timetabling</i>		X		
<i>Single Student Scheduling</i>			X	X
Enrolment, Registration & Transfer	X			
Exam Scheduling			X	
Attendance	X			
Report Cards & Transcripts	X			
Statistics	X			
Audio-Visual Scheduling	X			
Co-op Tracking		X		
Special Services		X		

1. Systems Focus Strategic Principles

1.1 Exhibit 5, on page 13, shows the current status of key applications. The development of those that are shown in bold italics will receive top priority.

1.2 The implementation time frame for these systems is:

	1992	1993	1994	1995	1996
FIS					
EIS					
SIS					

1.3 Shared Board systems will support departmental operations, evaluation, decision making and research.

1.4 Shared Board systems will permit online data entry, update and query.

1.5 Shared Board systems will have flexible reporting tools, information retrieval utilities, and features to share information with personal computers.

1.6 Implementation plans for shared Board Systems will be comprehensive and include such items as:

- benefits to the clients and the organization
- procedure and job redesign
- staff training and redeployment
- client support
- cross-department cooperation/communication
- managerial issues and culture change
- initial and ongoing post-implementation reviews
- testing and conversion strategy
- standards for information quality/integrity/security
- documentation and client support.

1.7 In the development of shared Board systems, there will be flexibility in "build vs. buy" software decisions and "lease vs. buy" hardware decisions.

2. Client Focus Strategic Principles

- 2.1 Shared Board systems will be managed by clients. Clients will be accountable for the effectiveness of the system once they receive appropriate training. This responsibility is vested with the principal or department/area manager who may delegate it to a staff member as appropriate.
- 2.2 "Client managed" means that the users are responsible for working with Information Management Services to define their needs, develop, test and implement systems. Clients will project-manage all systems implementations; they will accept responsibility for data integrity, report processing and training of new staff.
- 2.3 Staff will be trained in the shared Board systems to a level of skill to allow satisfactory job performance.
- 2.4 Principals and department/area managers are responsible for ensuring all staff have the requisite systems skills to perform their jobs and for budgeting funds for staff to receive appropriate training.
- 2.5 All principals and department/area managers will designate one of their staff as a systems-liaison person for that group.
- 2.6 The designated staff member will receive advanced skills training, be the initial point of contact for any systems problems with their staff and Information Management Services, and provide support until the problem is resolved. The individual will facilitate satisfactory and timely resolution of any problems.
- 2.7 Roles will be clarified and documented between client departments and Information Management Services for the development, operation and maintenance of systems as a part of the project-development process.
- 2.8 Each principal and department/area manager will maintain and update annually an inventory of:
 - hardware
 - software
 - applications
 - computer skills required for each position
 - computer training needs/plans for each staff member.

3. Information Quality Strategic Principles

- 3.1 Information created or obtained within the organization belongs to the organization -- not to any particular function, department or individual -- and is available to anyone in the organization who can demonstrate a legitimate need for requesting it.
- 3.2 Information that is required in the performance of one's responsibilities will be shared through arrangements made among clients.
- 3.3 Each shared Board system will have an identified sponsor who will be responsible for the overall performance and effectiveness of the system.
- 3.4 All data fields will have an identified custodian. The custodian will be the unit that needs the data most current and in its most detailed form.
- 3.5 Information for shared Board systems will be:
 - entered immediately
 - entered only once by the data field custodian, as close to the source as possible
 - stored in one central master copy on the system that is accessible by all authorized clients.

4. Communications Technology Strategic Principles

Below are the major elements of the network:

- 4.1 The electronic networks at all board sites will have communications capabilities, such as data, voice and fax, necessary to support efficient operations.
- 4.2 Trustees will have access to equipment from the Board and will be given appropriate training for its effective use.
- 4.3 Teachers will be provided with online access through computer workstations located in staff rooms and/or department head offices.
- 4.4 When required for the performance of their responsibilities, individual staff members will have a computer workstation.
- 4.5 The Board's shared systems will support authorized access 24 hours a day from both Board and non-Board locations.
- 4.6 Where possible, all major external organizations will have direct computer-to-computer communications for the appropriate exchange of data.
- 4.7 Staff will be trained to identify and use the most effective mode of communication (electronic mail, fax, phone, etc.).

- 4.8 The best technology will be selected for each identified client need with due consideration given to cost, client support and maintenance.
- 4.9 All principals and department/area managers will be responsible for budgeting funds for hardware and software.
- 4.10 Information Management Services will maintain and support a list of recommended products and vendors which clients may purchase. With prior consultation, Information Management Services may be able to support other products deemed necessary by clients.

Workstation Installation Schedule

Client Group	Current Workstations	Additional Workstations		Total Workstations
		1992	1993	
Secondary Offices	118	84	--	202
Vocational Offices	12	16	--	28
Elementary Offices	150	150	--	300
Secondary Guidance	25	48	--	73
Education Centre	145	18	--	163
Area Offices & Dundurn	40	12	--	52
Staff Rooms	0	--	120	120
Total	490	328	120	938

4 - RESOURCE ESTIMATES

The following section highlights the estimates for the financial resources required to implement and operate the IIS target environment. The significant totals from the estimates in exhibit 6a - lease option (see page 19) are:

- 5 year total estimated costs	\$6,455,000
- 1992 annual estimated	\$ 376,000
- 1993-96 average annual estimated costs	\$1,520,000

Key Assumptions

1. To minimize 1992 budget increases, equipment and staff acquisitions have been deferred until the latter half of the year.
2. For the purposes of exhibit 6a, all equipment is leased on a 48 month term basis. Amounts used to calculate annual costs are \$30 per thousand of purchase price with allowance made for applicable sales taxes.
3. To show comparative estimates for a purchase rather than lease plan, exhibit 6b (page 20) is included. It should be noted that the purchase plan, if implemented with the same timeframe as the lease plan, would have a dramatic effect on the 1992 budget (\$1,491,500 more) while having a more favorable cash flow over 5 years (\$858,500 less). As a result, the steering committee recommends the lease option, and all estimates are based on this option.
4. Training costs for office staff represent the replacement costs incurred in situations when offices cannot otherwise be covered (i.e. small Elementary schools). The estimate for this ongoing training cost will cover approximately 140 person-weeks per year.

Expenditure Summary

The summary of expenditure estimates below is based on the leasing option (as opposed to purchase):

RESOURCE	5 YEAR TOTAL
MAINFRAME	\$1,251,000
WORKSTATIONS	3,440,000
MAINTENANCE	140,000
STAFF	641,000
TRAINING	341,000
OTHER	642,000
TOTAL	6,455,000

YEAR	TOTAL
1992	\$376,000
1993	1,737,000
1994	1,464,000
1995	1,489,000
1996	1,389,000
TOTAL	6,455,000

The following two exhibits (6a & 6b) show a more in-depth breakdown of the estimates. In exhibit 6a the estimates for workstations are based on a 48 month lease beginning in the fall of 1992. In exhibit 6b the same estimates are based on purchase of all workstation equipment.

RESOURCE ESTIMATES (Lease Workstations)

RESOURCE	1992	1993	1994	1995	1996	TOTAL	COMMENTS
MAINFRAME	\$ 0	120,000	240,000	240,000	240,000	840,000	To handle increased processing load, additional workstations and significantly more complex databases the mainframe will require an upgrade of both memory and disk storage. This upgrade would be scheduled for the summer and therefore is budgeted for only 6 months lease payments in 1993.
MAINFRAME SOFTWARE	25,000	84,000	84,000	84,000	84,000	361,000	The mainframe would require several packaged software systems to handle the integrated environment: - Database storage and retrieval (indexing and query) - Enhanced security facility (mostly due to dial-in) - Auto operations for non-working hours (rather than staff)
NETWORK UPGRADE	0	0	10,000	20,000	20,000	50,000	Due to increased traffic on the data communication network, an upgrade of line speed may be required. This is not a given but must be forseen as a real possibility
WORKSTATIONS							Workstation equipment prices are based on 48 month lease
SECONDARY OFFICES	23,000	140,000	140,000	140,000	117,000	560,000	84 workstations 36 printers
VOCATIONAL OFFICES	5,000	27,000	27,000	27,000	23,000	109,000	16 workstations 8 printers
ELEMENTARY OFFICES	45,000	270,000	270,000	270,000	225,000	1,080,000	150 workstations 100 printers
SECONDARY GUIDANCE	14,000	82,000	82,000	82,000	68,000	328,000	48 workstations 24 printers
EDUCATION CENTRE	5,000	31,000	31,000	31,000	26,000	124,000	18 workstations 10 printers
AREA OFFICES	3,000	20,000	20,000	20,000	17,000	80,000	12 workstations 5 printers
STAFF ROOMS	0	113,000	227,000	227,000	227,000	794,000	120 workstations 100 printers
WORKSTATION SOFTWARE	5,000	210,000	50,000	50,000	50,000	365,000	\$500 per workstation plus \$100 per year for upgrades
MAINTENANCE	0	20,000	40,000	40,000	40,000	140,000	Service agreements and repairs
STAFF							
SUPPORT	0	100,000	100,000	100,000	100,000	400,000	2 fulltime training and support staff
REPAIR	0	0	25,000	50,000	50,000	125,000	1 repair technician
UNIV. CO-OP	30,000	20,000	10,000	10,000	10,000	80,000	Setup of microcomputer reporting software
SETUP	5,000	15,000	8,000	4,000	4,000	36,000	Casual help for install and setup
TRAINING & CONVERSION							
TECHNICAL	12,000	15,000	12,000	12,000	10,000	61,000	Computer Services technical courses
OFFICE STAFF	0	70,000	70,000	70,000	70,000	280,000	Casual replacements for staff in training (140 person weeks)
OTHER	204,000	400,000	18,000	12,000	8,000	642,000	Startup costs Renovations to Computer Room and operations area, additional training classroom, renovate support area at 220 Dundurn. Electrical and communication wiring in all buildings (avg \$2500). Consulting fees for project training, streamlining. Furniture allowance \$300 per workstation
TOTAL	\$376,000	1,737,000	1,464,000	1,489,000	1,389,000	6,455,000	

RESOURCE ESTIMATES (Purchase Workstations)

RESOURCE	1992	1993	1994	1995	1996	TOTAL	COMMENTS
MAINFRAME	\$ 0	120,000	240,000	240,000	240,000	840,000	To handle increased processing load, additional workstations and significantly more complex databases the mainframe will require an upgrade of both memory and disk storage. This upgrade would be scheduled for the summer and therefore is budgeted for only 6 months lease payments in 1993.
MAINFRAME SOFTWARE	25,000	84,000	84,000	84,000	84,000	361,000	The mainframe would require several packaged software systems to handle the integrated environment; - Database storage and retrieval (indexing and query) - Enhanced security facility (mostly due to dial-in) - Auto operations for non-working hours (rather than staff)
NETWORK UPGRADE	0	0	10,000	20,000	20,000	50,000	Due to increased traffic on the data communication network, an upgrade of line speed may be required. This is not a given but must be forseen as a real possibility.
WORKSTATIONS							Workstation equipment prices are based on capital purchase.
SECONDARY OFFICES	390,000					390,000	84 workstations 36 printers
VOCATIONAL OFFICES	76,000					76,000	16 workstations 8 printers
ELEMENTARY OFFICES	750,000					750,000	150 workstations 100 printers
SECONDARY GUIDANCE	228,000					228,000	48 workstations 24 printers
EDUCATION CENTRE	87,000					87,000	18 workstations 10 printers
AREA OFFICES	55,500					55,500	12 workstations 5 printers
STAFF ROOMS		630,000				630,000	120 workstations 100 printers
WORKSTATION SOFTWARE	5,000	150,000	110,000	50,000	50,000	365,000	\$500 per workstation plus \$100 per year for upgrades
MAINTENANCE	0	20,000	40,000	40,000	40,000	140,000	Service agreements and repairs
STAFF							
SUPPORT	0	100,000	100,000	100,000	100,000	400,000	2 fulltime training and support staff
REPAIR	0	0	25,000	50,000	50,000	125,000	1 repair technician
UNIV. CO-OP	30,000	20,000	10,000	10,000	10,000	80,000	Setup of microcomputer reporting software
SETUP	5,000	15,000	8,000	4,000	4,000	36,000	Casual help for install and setup
TRAINING & CONVERSION							
TECHNICAL	12,000	15,000	12,000	12,000	10,000	61,000	Computer Services technical courses
OFFICE STAFF	0	70,000	70,000	70,000	70,000	280,000	Casual replacements for staff in training (140 person weeks)
OTHER	204,000	400,000	18,000	12,000	8,000	642,000	Startup costs Renovations to Computer Room and operations area, additional training classroom, renovate support area at 220 Dundurn. Electrical and communication wiring in all buildings (avg \$2500). Consulting fees for project training, streamlining. Furniture allowance \$300 per workstation
TOTAL	\$ 1,867,500	1,624,000	727,000	692,000	686,000	5,596,500	

5 - BENEFITS AND SAVINGS

Developing a rationale for information systems based primarily on tangible dollar savings is never easy. Six major benefits have been identified that strongly justify the Board's investment in IIS. They include the following:

1. **Improved accountability** - IIS can provide more timely, accurate financial information to help both the academic and business managers more effectively control staffing, financial and student administrative matters.
2. **Cost effectiveness/Revenue enhancement** - IIS can help administrative staff to identify areas where improved systems can help the Board to contain expenditures or enhance revenues.
3. **Improved productivity** - IIS can help simplify routine administrative information processing and reporting, and improve the productivity of Board Administrative staff.
4. **Better decision making** - IIS can help improve both the quality of the data and the analysis that underlies important administrative decisions.
5. **Faster response** - IIS automated online systems can provide faster response to queries.
6. **Expanded services** - new information products or services that staff can provide with an expanded IIS.

Each of these benefits is discussed on the following pages.

1. Improved Accountability

There is an increasing demand that tax-funded organizations be accountable to the public for the effectiveness of their programs and their spending. Taxpayers are demanding information on how tax dollars are being spent and whether they are achieving the desired results. The shared Board systems can provide ways of measuring and monitoring the operations of schools and departments so that the Board knows exactly where its resources are being expended, for what purpose and with what results.

Accountability will be enhanced through IIS in several ways. First, information will be compiled in such a manner that decisions can be tracked at each level of approval. Second, it will be possible to pinpoint under- and over-utilization of resources so that prompt, corrective action can be taken. Third, service areas can be monitored to determine whether service levels are acceptable and to identify processing bottlenecks that need to be eliminated. For new systems to have maximum impact in improving accountability, departmental roles need to be reorganized and clarified at the same time as the IIS project is proceeding.

Client Feedback

"What do you do with supplies or textbooks surplus to your needs? Too often they have sat unused on shelves within a school. And when you need such materials, very often you have had to buy them outright."

"PROFS is now being used by schools to advertise their need for a few extra copies of books, and have their requests met at no cost by another school, simply in the spirit of sharing available resources. Similarly, Richard Beasley School recently advertised some surplus JK climbing equipment, which turned out to be needed by W. H. Ballard School. Prior to the implementation of PROFS, such communication was much less effective. PROFS has saved this Board money!"

Benefits by System

Practical examples follow of what will become possible as a result of the IIS project.

FIS

- up-to-the-minute information for department managers and principals on their account balances. With such information, they can be better stewards of the funds at their disposal - neither overspending nor under-funding projects for which they are responsible
- regular financial reporting by area of responsibility
- evaluation of financial information from a value-for-money or program-costing perspective

EIS

- improved control of staffing levels and costs
- better control of replacement costs and temporary assistance

SIS

- improved tracking of students with special needs in compliance with Bill 82
- monitoring of school population changes.

Potential Savings Area

One potential source of savings is improved information on absence, which will permit better control over both academic and administrative replacement costs. It is difficult to estimate precisely the total cost of absences in the Board. Replacement costs are reported for business staff in total, under "temporary assistance", while the cost of occasional teachers includes such education-related activities as staff development and school types, as well as leaves and sickness. Information systems that could segregate these costs, coupled with clear accountability and managers fully trained to deal with excessive absence, may reduce this cost by 1% to 2.0% on known annual costs of over \$5 million.

- $(1\% \text{ to } 2.0\%) \times \$5 \text{ million} = \$50,000 \text{ to } \$100,000$

2. Cost-Effectiveness/Revenue Enhancement

Automating many routine information-processing tasks and providing readily accessible information will free administrative staff to devote their energies to analyzing and controlling -- instead of filling in forms and generating reports. They will be able to control expenditures much more effectively and identify new revenue enhancement opportunities.

Benefits by System

Practical examples follow of what will become possible as a result of the IIS project.

FIS

- meet future financial demands with existing human resources
- reduce paid and unpaid overtime
- reduce the need for delivery services among locations
- improve monitoring and ability to access both existing and new revenue sources
- encourage electronic and data interchange with other Boards and agencies
- reduced storage space for filing
- reduced number of hard copy reports and subsequent garbage/recycling

EIS

- reduce need for additional staff overtime and casual help in Human Resources

SIS

- increased revenue through changes in assessment
- accurate, auditable student registers

- increased time spent on instructional leadership by vice-principals, principals and superintendents

Potential Savings Area

Better information has already helped to increase revenues or control costs. An excellent example is the revenue gained from enhancements to the Assessment and SIS systems made in 1989. The Board developed a direct communication link to City Hall's assessment records which is used to identify students who are separate-school supporters. As a result of this system change and diligent teamwork between Finance Department's Assessment group and school staff, the Board has realized additional assessment revenue of about \$1 million per year.

Cost reductions could also be achieved in a number of areas through better information systems, clear accountability and teamwork. Using integrated information systems, staff could analyze and control costs in ways that are not possible at present.

The following table identifies some areas of potential savings:

Expense Area	Annual Cost (\$mil)
Energy	\$ 6
Transportation	5
Photocopying	1
	\$12

A 1 to 2% improvement in cost control would yield savings of \$100,000 to \$200,000 per year.

3. Improved Productivity

It is always difficult to prove the assertion that improvements in information systems will lead to savings through staff reductions. This is particularly true when staff is already overloaded and crucial tasks cannot be carried out promptly. Nevertheless, integrated systems will eliminate duplicate preparation and entry of data, routine communication, analytical and reporting tasks. As a result, integrated systems -- especially when combined with streamlined administrative processes -- can at least prevent or reduce further increases in administrative staffing.

Benefits by System

Practical examples follow of what will become possible as a result of the IIS project.

FIS

- reduced paper exchange, manual completion and filing
- improved utilization of staff expertise
- improved response time to trustees, vendors, staff and external agencies

EIS

- reduce management time spent on staffing by providing better information as well as communicating decisions
- increased efficiency with automated processes replacing manual procedures (eg., Monthly Staffing Reports, Budget Analysis, Complement Control, Succession Planning, Collective Bargaining Data)

SIS

- reduce school and Research Department time spent in preparing time-consuming Ministry reports

Potential Savings Area

By improving productivity, an expanded IIS can reduce the rate of growth of administrative staff. This group includes:

- senior officials (superintendents and directors)
- academic support staff (psychologists, social workers)
- business support staff (accountants, programmers, employment officers)
- secretarial/clerical support staff (schools, area offices, Education Centre)

As the chart below shows, in the seven years since 1984, administrative staff has been the fastest growing component of the Board's overall staff with an overall increase of 24.6% in full-time equivalents (FTE).

Staff Group	*Full Time Equivalents			Average Annual %
	1984	1991	% Change	
Total Staff	3,537	4,227	19.5%	2.8%
Teachers	2,428	2,792	15.0%	2.1%
Administrative Staff	391	487	24.6%	3.5%

* based on monthly Board Staff report - FTE Positions dated March/91 and October/91.

Some of the administrative staff growth is a result of the increased volume and complexity of the administrative work (eg., special education, employment equity, separate school assessment tracking, etc.). A large proportion is the result of administrative information systems and processes that have fallen behind the increased volume and complexity of work. (See Section 1 for a list of significant changes.)

More efficient and effective IIS, together with streamlined processes, should result in administrative staffing growth which parallels that for teachers (i.e., an average annual rate of 2.1% versus the current 3.5% over the same period).

- At the current growth rate: $(487 \times 3.5\% \times 5 \text{ years}) = 86 \text{ staff}$
- At the reduced growth: $(487 \times 2.1\% \times 5 \text{ years}) = \underline{52 \text{ staff}}$
- Potential staff avoidance: 34 staff
- Potential savings: $(34 \text{ staff} \times \$35,000 \text{ avg. salary/benefits}) = \$1,190,000$

4. Better Decision-making

One of the primary purposes of information is to support and facilitate decision-making. Accurate, relevant, timely and complete information reduces the uncertainties that affect the quality of decisions.

Decision-making can be improved in the Board through IIS. By automating manual processes that are repetitive or computational in nature, IIS will improve accuracy and speed up the availability of information. By ensuring that there is only one version of the truth -- used by everyone for financial, staff, and student administrative matters -- decision-makers will spend less time reconciling data and have greater confidence in the final decisions.

Benefits by System

Practical examples follow of what will become possible as a result of the IIS project.

FIS

- provide timely financial information from both a historical and forecasted perspective
- electronic communication will provide faster response

EIS

- more accurate and refined analysis of staffing provisions, eg., PTR's, class sizes, class loadings, teacher workloads, enrolments, etc.
- more accurate staffing forecasting for budget
- better information for decision-making during collective bargaining

SIS

- improved forecasting and better trend analysis
- accurate identification of school needs for teacher complement and skills required

5. Faster Response

Shared Board systems will promote more efficient operations in all facets of the Board's business. Routine tasks will be done by computers, which can perform them much faster and more accurately than people can. Through IIS, electronic communication will allow instantaneous updates to information and then facilitate access to and sharing of that information. The time needed to research information from multiple sources will be reduced. In addition, the electronic creation, approval, and communication of requests will result in the timely provision of goods and services.

Client Feedback

"To book kits for my school, I was required to arrive by 7:30 a.m. on November 13 at the Dundurn warehouse. Even at 7:18 I stood 30th in line in the hall, waiting to affix stickers to sign-up lists, in order to reserve the kits. When the doors opened, it was like feeding time in a fish tank. Some kits I was able to reserve when my colleagues needed them. But by the time I reached other kits, they were available only at inappropriate times, if at all. For example, one class in the school will get the Insect kit from late-February to late March. How do you find ants in a snow-drift?"

"If ever we needed an on-line reservation system, it's this one. Of all the on-line systems, a Curriculum Resources booking system would have the most direct benefit to the teaching/learning processes in our schools. As part of their planning responsibilities, teachers could acquire the curriculum materials needed to support their lessons in a planned, orderly manner. As it stands, I don't ever want to do it the old way again!"

Randy Peaker, Teacher, Richard Beasley School

Benefits by System

Practical examples follow of what will become possible as a result of the IIS project.

FIS

- shorten the purchasing cycle (budgeting, ordering, delivering, paying)
- more effective utilization of purchased goods and services

EIS

- more efficient filling of staff vacancies, through the processes of posting and recruiting
- immediate responses to enquiries from employees, based on accurate, timely, and available information
- more effective contract maintenance, to avoid labour relations problems

SIS

- improved planning and delivery of programs through on-line teacher research into and reservation of curriculum materials such as kits, audio-visual materials, and instructional software. Delivery within 24 hours

6. Expanded Services

With the IIS in place, staff will be able to analyze, synthesize, integrate, and share massive amounts of information, easily producing reports that have not been available previously. Staff will be able to fill information requests that cannot be met today because they are too time-consuming, or they impede normal operations, or the information is not available.

Benefits by System

Practical examples follow of what will become possible as a result of the IIS project.

FIS

- provide on-line inquiry by schools/departments

EIS

- more information available at locations where information is needed, fewer phone calls to Human Resources, more first call responses from Human Resources

SIS

- instant response to queries regarding timetables, marks, attendance, special needs status, etc.

Other

- calendaring for trustee meetings through PROFS
- on-line procedures, policies, and manuals

Other Considerations

Specific savings for complex, integrated systems are dependent on a number of factors that go beyond the effective resolution of technical issues such as hardware capacity and systems design. They include such items as:

- management/staff commitment to use the new system and keep the data accurate. For example, will school staff use the automated system for student records and electronic mail, or do they prefer their manual ledgers and memos sent via courier?
- changes in policies, practices, roles and responsibilities, collective agreements, culture, recognition and rewards. With a new purchasing system, for instance, will requisitions continue to be typed at schools and entered centrally at the Education Centre before the purchase order is sent, or will they be entered directly at the schools?
- training, support and management development.
- teamwork and cooperation.

In addition, any board of education faces challenges in harvesting the potential savings and benefits associated with new systems. For the Hamilton Board, several issues make it difficult to commit to concrete savings regarding the impact of IIS:

- **Limited labour-cost flexibility**- approximately 80% of the costs of operation are in salaries and benefits, many of which are covered by collective agreements. The Board has limited flexibility when attempting to reallocate labour costs.
- **Rising workload and limited resources** - it is difficult for administrative staff to guarantee productivity gains when there are jobs that cannot be done effectively now. For example, Human Resources receives over 4,000 unsolicited job applications a year, but they don't have time to acknowledge them.
- **Role clarity** - some systems have the potential to reduce utilization or consumption of scarce resources (eg., absence/sick time control, energy control). However, it is not always clear who currently has or should have the responsibility and authority to control the expenditure -- Education Centre superintendent, area superintendent, or principal.
- **Unknown external demands** - Will the provincial or federal government impose new legislation that will result in changes in resource consumption over which we have no control?

Investment Summary

The preceding analysis identifies three major potential savings areas:

	Potential Annual (\$000)
Improved accountability - absence control	25-50
Cost effectiveness - cost control of energy, transportation and photocopying	100-200
Improved productivity - reduced staff growth	1,190
Total potential annual savings	\$1,315-1,440

This potential assumes that the system is fully installed and the appropriate processes streamlined and roles redesigned. The potential savings can be compared to the annual estimated costs for IIS resources in the following years:

IIS Investment Summary

Benefits and Savings	Costs
1. Increased accountability 2. Cost effectiveness/resource enhancement 3. Improved productivity 4. The basis for better decision making 5. Faster response 6. Expanded services	1992 cost estimate \$ 409,000 1993 cost estimate \$1,781,000 1994 cost estimate \$1,531,000 1995 cost estimate \$1,556,000 1996 cost estimate \$1,468,000 Total investment \$6,744,000
Potential annual savings range \$1,315,000 to \$1,440,000	Avg. annual est. cost \$1,349,000

The Board needs to consider whether it is worthwhile investing an estimated annual average of \$1.4 million to achieve the benefits listed above and potential annual savings \$1.3-\$1.4 million.

6 - IIS IMPLEMENTATION PLAN

This section identifies the plan for implementing IIS, including the key activities and requirements for success.

Key Activities

Exhibit 7, (see page 33) highlights the phasing, sequencing and approximate duration of the key activities. The dark bars on the draft represent activities related to the IIS implementation projects, while the lighter bars represent ongoing operational responsibilities.

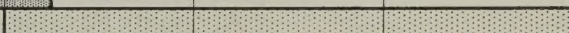
The first three activities involve the implementation of the three key integrated systems: FIS, EIS and SIS. For purposes of this plan, it is assumed that the systems will be developed by Computer Services. There may be some applications for which package software may be appropriate.

Development of each of the systems will involve the following major steps:

1. analyze needs
2. specify information requirements
3. detail systems design
4. document new procedures and systems
5. train clients
6. test systems
7. implement new systems
8. conduct post implementation review
9. make modifications to roles, training, procedures, processes and systems as required.

The phasing for each of the three systems is described in more detail on the following pages.

Implementation Plan

		1992	1993	1994	1995	1996
1 FIS	Phase 1					
	Phase 2					
	Phase 3					
	Maintenance					
2 EIS	Phase 1					
	Phase 2					
	Maintenance					
3 SIS	Phase 1					
	Phase 2					
	Maintenance					
4 Client Departments	Select staff					
	Streamline					
	Reorganize					
	Train OIS					
	Train IIS					
5 Computer Services	Technical training					
	Plan sites					
	Wire/furnish					
	Install workstations					
	Upgrade Mainframe					
Legend						
		Project Task				
		Ongoing Operations				

1. FIS

Section 3, *Target Environment*, identifies the priorities for FIS. They include:

- Phase 1: Payroll (operational first quarter, 1993)
- Phase 2: Financial Reporting and Budgeting. This phase includes the upgrading of seven systems and the development of four new systems. These systems will become operational during 1993 and 1994. Depending on the nature of the upgrades, some of the modifications may be operational in 1992 as normal maintenance activities. These applications include:

Upgraded	New
Budget	Grants and Subsidies
Purchasing	Property and Insurance
Accounts Payable	Transportation
General Ledger	Warehousing
Assessment	
Work Orders	
Energy	

- Phase 3: Financial Analysis and Control. This phase involves three applications which will be operational in the 1994/5 time frame. They include:
 - Forecasting
 - Program Costing and Monitoring
 - Audit.

2. EIS

Phase 1 involves the upgrading of three systems and two new applications to become operational in 1992.

Upgraded	New
Staffing/Position Control	Benefits Administration
Leaves/Absence Management	Time and Attendance Monitoring
Wage and Salary Administration	

Phase 2 involves nine applications which will become operational in the last half of 1992 and early 1993.

Upgraded	New
Job Evaluation/Clarification	Employment Application Management
Employee Records	Applicant Tracking/Employment Equity
Collective Bargaining/ Contract Maintenance	Supply Staff Dispatching Staff Training & Development Monitoring
Skills/Qualifications Inventory	Performance Management

3. SIS

SIS has five existing applications that require only maintenance. The major development/upgrades are divided into two phases.

	Upgraded	New
Phase 1 Operational in 1992	Download to Microcomputer School Timetabling	Curriculum Resources Scheduling Single Student Scheduling
Phase 2 Operational in 1994	Co-op Tracking Special Services	Examination Scheduling

4. Client Departments

Administrative department heads, superintendents and principals must complete several concurrent activities to ensure the successful transition to client-managed systems in the implementation of IIS. They include the following:

- a) **Select staff** - nominating existing staff as project managers, making staff available to work on project teams that will implement shared Board systems and ensuring that staff update their systems skills/training needs annual surveys in the fall of each year.
- b) **Streamline** - appointing cross-department work teams to look at major administrative processes. The staff teams will identify:
 - redundant activities (eg., multiple approvals, multiple form copies that are not required);
 - time delays (eg., filing and inspection); and
 - causes of errors (eg., forms design, instructions, training) in paper flow processes leading up to the computer system, or coming as output from automated systems.

- c) **Reorganize** - involves work teams examining roles to clearly define expected results and accountability for the team and each team member. It also involves reviewing reporting relationships and organization structure to ensure that staff are being used most effectively, based on their skills and the new system.
- d) **Training** - Managers must ensure that their staff receive their systems training in a timely manner so they can make full use of the new systems on the job. Managers must also ensure that their staff use the systems and keep the data up to date after they have received their training.

Having analyzed the existing flows, they will then develop improved streamlined systems.

One major Ontario Board recently completed three separate streamlining projects in their Human Resources Department involving academic staffing, business staffing and employee records. The catalyst to start the project was the rising workload, declining client satisfaction and the Board's refusal to approve a request for a staffing increase of 10%. They achieved the following results:

- improved productivity by 20 to 40% on the three processes.
- cut the turnaround time by 50% in hiring staff
- improved client satisfaction and staff morale, and significantly reduced workload peaks and overtime
- no additions to Human Resources staff complement in the last two years or for the foreseeable future.

Without process streamlining, new systems seldom achieve significant productivity improvements.

New clients will initially be trained in office systems (OIS) to develop their basic computer skills, and then in the appropriate IIS applications.

5. Computer Services

The explosion in the number of clients and the growth of applications has outpaced the Computer Services Department's ability to meet the clients' support needs. Such issues as training, support, site plans, and coordination of wiring and office layout/furnishings in the remote sites will consume increasing amounts of time. As a result, the Department will need to gradually upgrade their client support and technical staff as the number of clients and applications grows over the next three years.

Computer Services has traditional responsibilities for operating a large central mainframe (e.g., analyze network, upgrade the mainframe and the network as the number of applications and clients increase to ensure acceptable performance). These activities will occur periodically and will be driven by the growth of IIS systems/clients.

Requirements For Success

Four key requirements must be met if the Board's investment in IIS is to be successful:

1. **Resources** - the project needs the resources identified in this strategy in the time periods identified if we are going to meet our implementation targets.
2. **Commitment** - the project requires the commitment of stakeholders at three levels in the organization to be successful.
 - Trustees/Senior Management - to define their key information needs, help solve managerial issues and ensure that adequate resources are available
 - Middle Manager/Principals - to ensure staff are made available for project teams, receive training and use the systems effectively.
 - Front-line Staff/Bargaining Units - staff are willing to learn new skills, change procedures and roles and, with the Board's assistance, deal directly, equitably and compassionately with employment concerns.
3. **Traditions** - there are three issues relating to traditions which the organization must address during the implementation:
 - teamwork between the business staff, academic staff and trustees to solve implementation issues and realize the potential benefits of the IIS
 - willingness to share traditionally proprietary information across departments
 - active support of the thrust to client-managed systems and acceptance by both clients and Computer Services of their new roles.
4. **Skills Development** - two important skill issues are:
 - project expertise - client project managers must receive the training and support they need to do their jobs. Systems professionals must receive both the technical and people-skills training they need to fulfill their dual roles as technical leaders and consultants/coaches to clients.
 - training - Everyone in the Board must appreciate the value and the cost of proper initial training and ongoing, in-service training to make IIS effective and reliable.

This strategic plan addresses these important requirements for success. The Steering Committee looks forward to responding to any questions trustees may have regarding the scope or approach suggested, and ultimately your support for the changes recommended in this report and the resources required to implement them.

The challenge in front of the Trustees and Senior Management is difficult, but surprisingly simple.

1. Does this project proposal meet the Board's basic need for improved information systems, streamlined procedures, clarified roles and responsibilities, and improved teamwork and cooperation?

2. Is the IIS project important enough that it should proceed even with the current budget constraints?
3. If the IIS project does not proceed, how will the Board meet its needs for improved information, improved productivity and clear accountability?

SUPPORTING DOCUMENTATION

The following is a list of documentation containing more detailed information related to the IIS Strategic Plan. Copies of this material are available to trustees upon request.

1. Minutes, Special Meeting of the Development Committee - "System Planning Priorities (1991-1994)", May 30, 1991.
2. IIS Workshops (5), Managerial Design Corporation, June 1991.
3. Minutes, IIS Steering Committee, October 8, 1991.
4. IIS Strategic Planning Workshop, Managerial Design Corporation, October 29, 1991.
5. Systems Development Project Report - "Employee Information and Payroll Systems - Problem Definition", EIPS Project Team, March 7, 1991.
6. "Curriculum Resources Information Systems", Dave Didur, October 29, 1991.
7. "The Student Information System", Ron Watson, November 5 & 18, 1991.
8. "Make Your Office More Productive", Ronald Henkoff, Fortune, February 25, 1991, Pages 72-84.
9. "Quality Comes To City Hall", Joseph Sensenbrenner, Harvard Business Review; March-April, 1991, Pages 64-75.
10. "GE Keeps Those Ideas Coming", Thomas A. Stewart, Fortune, August 12, 1991, Pages 41-49.



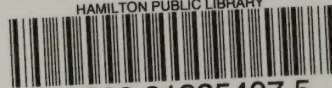
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